IS HYPERSENSITIVITY/ALLERGY CLASSIFICATION VALID TODAY?

Prof. Ahmed Elghobary and prof. Mohamed Aref

1 Department of Clinical Pathology, faculty of medicine, Al-Azhar University
2 Department of Medicine and Clinical Immunology, faculty of medicine, Al-Azhar University

Von Pirquet (1874-1929) introduced the term "allergy" in 1906. He described a change to the reactivity of the organism namely in time, quantity and quality. In contrast to the widely accepted use of the "allergy" today, it is restricted to specific immunologic hypersensitivity reactions against harmless foreign antigens. He wanted to describe in general a change in reactivity of the organism, namely in word "allergy" today, when it is restricted to specific immunologic hypersensitivity reactions against harmless foreign antigens. Allergy in Pirquet's sense comprised a general term indicating increases and decreases of the reactivity, and so both hypersensitive and hyposensitive reactions. With the expansion of understanding sunstones (so called allergens) it also on endogenous factors of the organism itself. (Stanford 2016).

Although the postulation of Pirquet that he described over 100 years, ago, the theory still valid. The present work was a trial to discuss the strength and week points of this theory.
Hypersensitivity (allergy) is described as altered tissue reactivity to an antigenic substance as a result of repeated or prolonged contact with a specific substance. Von Pirquet included all immunole reactions which produce harmful effects on the host. In other words, specific acquired change in host reactivity mediated by immunologic mechanism causing an untoward response. The responsible for an allergic reaction is called allergen.

Hypersensitivity/Allergy was classified into 4 groups according to the clinical observation of the skin test as follow (Huber and wochenschr (2006).

Type 1: It is IgE mediated hypersensitivity. This type gives a positive reaction within 15 minutes. The word allergy is usually applied to type one hypersensitivity.

Type 2: It is Cytotoxic or Cytolytic through an antibody mediated reaction in target organ through an inflammation reaction of the target organs. Transfusion reaction, Hemolytic diseases of the newborn, autoimmune hemolytic anemia best are examples.

Type 3: It is antibody and complement mediated inflammation. Both type 2 and 3 gives positive skin reaction after 8 hours. Serum sickness is the best example.

Type 4: It is cell mediated mediate hypersensitivity. This type gives a positive skin reaction after 24 hours. Activated lymphocyte is mediating the pathological reaction. Allergic contact dermatitis, tuberculin type of hypersensitivity, allograft transplantation reaction are the best examples.

Allergy/hypersensitive is an unusual response in an individual to a substance or a condition which is harmless to others. It is an over reaction. The word allergy applied to type 1 hypersensitivity is substances that the immune system consider it harmful even if they are not.

A normal reaction should be the developments of immunity. The antibodies involves in allergies are known as IgE. People who usually are affected to allergy produce large quantities of IgE. These IgE antibodies lunch back against a
perfectly harmless substances such as rasp pollen, and cat dander (dDandruff) drug like penicillin etc.

Other main components to allergies are mast cells. A mast cell has about 1000 histamine containing granules in its cytoplasm and on its surface it has up to 1 million receptors for IgE antibodies. IgE encounters allergens when it activated the mast cells to release histamine and other chemicals.

- However, there are points, worthwhile mentioning as follows:
  - Type 1 allergy.
    1. Serum levels of IgE in type 1 is not always increased
    2. Allergy and hypersensitivity are the same meaning although there are different pathology, but not in the clinical feature histamines the primary pathology differential type solestane of hypersensitivity
    3. According to the definition of allergy, all types are due to non self-antigen precipitated by cell antigen, while type 2 and type 3 are precipitated by non self antigens.
    4. Although vaccine is a line of treatment of allergy, both food and drugs induced allergy is not.

Type II Hypersensitivity: 1 cytotoxic Compatibility in newborns (Erythroblastosisfetalis) . 2. Rheumatic heart disease 3. Blood transfusion reaction 4. Drug induced hemolytic anemia 5. Thrombocytopenia

According to definition of allergy, all types are due to non self antigens. Types 2,3 are precipitated by self antigen. In Type 2 definition of allergy, all types are due to non self antigen. In fact, type 3 and type 2 was overlapping.

Type III hypersensitivity: immune complex:

- These reactions are mediated by IgG antibodies, which combine with the antigens to form immune complex that subsequently activate the complement system leading to inflammation, Vasculitis, and tissue damage act..

- It occurs when immune complexes (Ag-Ab) are not removed from circulation (due to presence of excess of Ag and Ab) and are deposited in various tissues and organs such as kidneys, Joints, Lung and Skin

Examples are Serum sickness, Lupus erythematosus Rheumatoid arthritis and allergic stomatitis
Although IgE in Type 1 hypersensitivity is the cornerstone, its absence has many explanations, but lack of approval. However, skin test is sensitive but lack of specificity.

Our suggestion depends on evaluation of serum histamine. If is high, patients are considered type 1, which can be vaccinated, and anti-histamine is a helpful therapy.

On the other hand, if serum histamine levels is normal, total IgG and IgM were estimated. If high, this could be type 2 or type 3 hypersensitivity. They could be differentiated by estimation of complement C3.

According to Perqute theory for patients of type 2,3 the clinician dealing with active diseases not with disease itself. So, ESR and CRP are the most value to follow up for disease activity.

REFERENCES:


[100 years of allergy: Clemens von Pirquet - his idea of allergy and its immanent concept of disease].

Testing children for allergies: why, how, who and when: an updated statement of the European Academy of Allergy and Clinical Immunology (EAACI) Section on Pediatrics and the EAACI-Clemens von Pirquet Foundation.


A history of pediatric immunology.

Latent tuberculosis testing through the ages: the search for a sleeping killer.


Origin of Allergy From In Utero Exposures to the Postnatal Environment.